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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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EXAMINER	
SEDIGHIAN,R	
ART UNIT	**PAPER NUMBER**
2733	9

DATE MAILED: 07/17/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	Applicant(s)
08/923,461	Viet Le et al.
Examiner	**Group Art Unit**
Mohammad Sedighian	2733

☒ Responsive to communication(s) filed on *May 4, 2000*

☒ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire *3* month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

☒ Claim(s) *1-40* is/are pending in the applicat

Of the above, claim(s) _____ is/are withdrawn from consideration

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) *1-40* is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____ .

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

1. This communication is responsive to applicant's 05/04/2000 amendment in the application of Viet Le et al. for "Method and System for Modulator Multiplexing and Amplification in a Multi-Channel Plan", filed 09/04/1997. The amendment to the claims have been entered. Claims 1-40 are now pending.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

3. Claims 1, 7-10, 14, 16, 20, 27, 29-30, 34-36 and 40 are rejected under 35 U.S.C. 102(e) as being anticipated by Otsuka et al. (US Patent No: 5,841,557).

Regarding claims 1 and 14, Otsuka disclosed a system for modular amplification of optical signals (fig. 15) comprising: a first multiplexing unit (3-1, fig. 3) for multiplexing the optical signals (col. 9, lines 13-15) in the set of multiple channels (1-1, 1-3, fig. 3) into at least one subgroup of optical signals (col. 9, lines 10-13) in a respective at least one subwindow (col. 9, lines 10-11) within the operating window (col. 17, lines 32-37 and fig. 12), each subwindow corresponding to a different group of channels within the operating window (col. 9, lines 5-13); and at least one optical line amplifier (18W, fig. 15) for amplifying (col. 19, lines 49-53) said at

least one subgroup (P1, fig. 15) of optical signals corresponding to said at least one subwindow within the operating window (ch.1 to ch.2i, fig. 15).

Regarding claims 7,20, 29, 34-35 and 40, Otsuka disclosed a plurality of optical line amplifiers (18W, 18P, fig. 15) and further disclosed said first multiplexing unit comprises of a first coarse wavelength division multiplexing unit (16, fig. 24) for multiplexing the optical signals in the set of multiple channels (12-1, 12-2, 12-I, fig. 24) into first, second, third, and forth subgroups (G1, G2, G3, G4, fig. 24), and first, second, third, and fourth fine wavelength multiplexing units (13-1, 13-2, 13-3, 13-4, fig. 24) for carrying optical signals having different wavelengths (col. 23, lines 44-48).

Regarding claim 8, Otsuka further disclosed a second multiplexing unit (13-8, fig. 15), one optical fiber coupled between said first and second multiplexing unit (P1, P2, fig. 15), and said at least one line optical amplifier being optically coupled to said at least one optical fiber (18W, fig. 15).

Regarding claim 9, Otsuka further disclosed said first multiplexing unit comprises a coarse WDM unit (col. 33, lines 29-34) and at least one fine WDM unit (col. 33, lines 13-15), whereby fine WDM units can be added to the system in a modular fashion (fig. 7).

Regarding claim 10, Otsuka further disclosed zero-dispersion shifted optical fiber for the transmission line (col. 2, lines 65-67, col. 3, lines 1-3).

Regarding claim 16, 30 and 36, Otsuka further disclosed multiplexing in first, second, third, and fourth subgroups (col. 13, lines 20-23, 42-45 and 16, fig. 7) in corresponding

subwindows, wherein said first subwindow includes a first group of channels (ch.1, ch.5, ch.4i-3, fig. 7), said second subwindow includes a second group of channels (ch.3, ch. 7, ch 4i-1, fig. 7), said third subwindow includes a third group of channels (ch.2, ch.6, ch.4i-2, fig. 7), and said fourth subwindow includes a fourth group of channels (ch.2, ch.8, ch.4i, fig. 7).

Regarding claim 27, Otsuka disclosed a first (16, fig. 7) and a second (13-1, fig. 7) wavelength division multiplexing unit, and a fiber link optical coupling (col. 1, line 40) the multiplexers.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 2-6, 15, 17-19, 31-33 and 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otsuka et al. (US Patent No: 5,841,557) in view of Meli et al. (US Patent No: 5,946,117).

Regarding claims 2, 15, 17, 31 and 37, Otsuka further disclosed an erbium-doped fiber optical amplifier (col. 1, lines 26-28 and 18W, fig. 15), and a plurality of optical signal transmission channels of different frequencies (col. 9, lines 19-25, and 1-1 to 1-N, fig. 3). Otsuka differs from the claimed invention in that Otsuka does not disclose an operating window that comprises an erbium band of wavelengths between approximately 1520 nm and 1561 nm.

However, Meli, from the same field of endeavor, disclosed an optical transmission system (fig. 14) comprised of a plurality of optical sources (28a, 28b, 28c, 28d, fig. 14) that generate optical signals of different wavelengths (col. 11, lines 1-14), optical multiplexers (39, 46, fig. 14), single-mode optical fibers (col. 12, lines 1-2 and 42a, 42b, 42c, fig. 14) and optical amplifiers (43a, 43b, 43c, fig. 14). Meli further disclosed an erbium band of wavelengths between 1530 nm and 1560 nm (col. 17, lines 1-3). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate an optical signal transmission method and an optical signal transmission band of 1530 nm to 1570 nm, such as the one of Meli for the signal transmission system of Otsuka in order to have a uniform behavior for all channels, in the presence of line amplifiers designed to have a substantially uniform response to the different wavelengths in a cascade operation.

Regarding claim 3, Otsuka further disclosed multiplexing in first, second, third, and fourth subgroups (col. 13, lines 20-23, 42-45 and 16, fig. 7) in corresponding subwindows, wherein said first subwindow includes a first group of channels (ch. 1, ch. 5, ch. 4i-3, fig. 7), said said second subwindow includes a second group of channels (ch.3, ch. 7, ch 4i-1, fig. 7), said third subwindow includes a third group of channels (ch.2, ch.6, ch.4i-2, fig. 7), and said fourth subwindow includes a fourth group of channels (ch.4, ch.8, ch.4i, fig. 7).

Regarding claims 4, 17, 31 and 37, Otsuka disclosed an optical transmission system as discussed above in claims 3, 16, 30 and 36. As to groups of channels that comprises different ranges of wavelengths, Otsuka disclosed a plurality of different signal light transmission sections

in plurality of groups for different wavelengths. Meli disclosed sources that generate respective optical transmission signal in a plurality of different wavelengths within a transmission band of 1530 nm to 1560 nm, therefore, it is obvious to incorporate a first range of wavelengths approximately between 1530 to 1536 nm, a second range of wavelengths approximately between 1538 to 1543 nm, a third range of wavelengths approximately between 1547 to 1553 nm, and a fourth range of wavelengths approximately between 1555 to 1561 nm, for the different groups of signal light transmission sections in the transmission system of Otsuka.

Regarding claim 5, 32 and 38, Otsuka disclosed multiple channels in the operating window comprises sixteen channels (col. 3, lines 19-20 and ch.1 to ch.16 in fig. 7), and said first, second, third, and forth groups of channels each have four channels (ch.1, ch.5, ch.9, ch.4i-3, fig. 7).

Regarding claims 6, 19, 33 and 39, the combination of Otsuka and Meli disclosed an optical transmission system as discussed above in claims 2-5, 14-18, 29-32 and 35-38. Claim 6, 19, 33, and 39 require similar limitation as recited in claims 2-5, 14-18, 29-32 and 35-38 above. Therefore, claims 6, 19, 33 and 39 are rejected for the same reasons as recited in claims 2-5, 14-18, 29-32 and 35-38.

Regarding claim 18, the combination of Otsuka and Meli disclosed an optical transmission system as discussed above in claim 17. Otsuka disclosed fine multiplexing (col. 33, lines 13-15 and 13-1, fig. 7) of optical signal for a first to fourth groups of channels (fig. 7) to individual channels (ch. 1, ch. 2, ch. 3, ch. 4, fig. 7).

6. Claims 11 and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otsuka et al. (US Patent No: 5,841,557) in view of Baker (US Patent No: 5,452,124).

Regarding claims 11, 21 and 23, Otsuka disclosed optical signals are traveling in a unidirectional traffic (figs. 3, 7). Otsuka differs from the claimed invention in that Otsuka does not clearly disclose that the first and the second multiplexing units are arranged at first and second sites. However, Baker disclosed a unidirectional amplification for bi-directional transmission system using wavelength division multiplexing (figs 2, 8), wherein optical multiplexers (203, fig. 8) are located at first and second sites (col. 1, lines 61-64). Therefore, it would have been obvious to incorporate multiplexers at first and second sites, such as the ones in the system of baker in order to have a different multiplex signal transmission configuration depending upon the wavelength chosen for signal transmission and also transmission distances.

Regarding claim 22, Otsuka disclosed a plurality of parallel optical transmission paths (fig. 7) comprised of zero-dispersion shifted optical fibers (col. 2, lines 65-67, col. 3, lines 1-3).

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Otsuka et al. (US Patent No: 5,841,557) in view of Onaka et al. (US Patent No: 5,886,804).

Regarding claim 13, Otsuka differs from the claimed invention in that Otsuka does not disclose that optical line amplifier includes a dispersion compensating device. Onaka disclosed an optical multiplex transmission system (fig. 1), wherein a plurality of optical signals (col. 2,

lines 12-13 and fig. 1) are multiplexed (3, fig. 1) and further amplified (6, fig. 1). Onaka further disclosed optical line amplifiers include a dispersion compensating device (col. 2, line 42-46 and 8, fig. 1). Therefore, it would have been obvious to provide dispersion compensating such as the one of Onaka in the system of Otsuka in order to provide dispersion compensation to further increase the range of transmission speed and transmission distances.

8. Claims 26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otsuka et al. (US Patent No: 5,841,557) in view of Little et al. (US Patent No: 5,430,568).

Regarding claims 26 and 28, Otsuka differs from the claimed invention in that Otsuka does not disclose compensating dispersion magnitude separately for each subwindow. Little disclosed an optical multiplex transmission system (fig. 1), wherein a plurality of optical signals (CHa, CHb, CHc, CHd, fig. 1) are multiplexed (11, 12, 13, 14, fig. 1) and further amplified (BA, fig. 1). Little further disclosed dispersion compensating devices for each subwindow (col. 6, lines 36-39, col. 12, lines 52-57 and 36-39 in fig. 1). Therefore, it would have been obvious to provide dispersion compensation such as the one of Little in the system of Otsuka in order to provide dispersion compensation to further increase the range of transmission speed and transmission distances of the optical transmission system.

9. Claims 12 and 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otsuka et al. (US Patent No: 5,841,557) in view of Little et al. (US Patent No: 5,430,568) and in further view of Baker (US Patent No: 5,452,124).

Regarding claims 12 and 24, Otsuka disclosed one subgroup of optical signals (fig. 7) comprises first to fourth subgroups of optical signals (ch. 1, ch. 5, ch. 9, ch. 4i-3, fig. 7) in corresponding first to fourth subwindows (13-1, 13-2, 13-3, 13-4, fig. 7), a second multiplexing unit (16, fig. 7), and first to fourth optical fibers arranged in parallel between the multiplexers (fig. 7). Otsuka differs from the claimed invention in that Otsuka does not disclose a first to fourth optical line amplifiers optically coupled along said first to fourth optical fibers. Little disclosed a wavelength division multiplex transmission system (fig. 1) that comprises of a first to fourth optical line amplifiers (BA, fig. 1) optically coupled along a first to fourth optical fibers for amplifying a plurality of different multiplexed optical signals (col. 5, lines 20-32). Therefore, it is obvious to incorporate optical amplifiers such as the one in the system of Little for each optical line in the communication system of Otsuka to provide a plurality of different multiplexed amplified optical signals. The combination of Otsuka and Little further differs from the claimed invention in that Otsuka and Little do not disclose first and third optical fibers and line amplifiers pass optical signals traveling in a first direction and second and fourth optical fibers and line amplifiers pass optical signals in a second direction opposite to the first direction. Baker, from the same field of endeavor, disclosed a bi-directional transmission system (fig. 8) that comprised of a plurality of different optical signal transmission channels (TX_1, TX_2, fig. 8)

located at different sites (A, B, fig. 8), wherein optical signals are multiplexed (203, fig. 8), amplified (401, 403, fig. 8), and transmitted in a first and a second directions. Therefore, it is obvious to incorporate optical fibers and line amplifiers such as the ones of Baker for the modified communication system of Otsuka and Little to provide a bi-directional optical multiplex signal transmission system.

Regarding claim 25, Little disclosed multiplexing (203, fig. 8) the optical signals in the set of multiple channels (TX_1, TX_2, fig. 8) into a first subgroup of optical signals and demultiplexing (201, fig. 8) the optical signals in the set of multiple channels (RX_1, RX_2, fig. 8) into a second subgroup of optical signals. Therefore, it is obvious to incorporate a method of multiplexing and demultiplexing such as the one of Little in the system of Otsuka for multiplexing optical signals into a first and third subgroup of optical signals and demultiplexing the optical signals into a second and fourth subgroups of optical signals in order to transmit and receive optical signals of different wavelengths at one site in a communication system.

10. Applicant's arguments filed 05/04/2000 have been fully considered but they are not persuasive. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., **reducing dispersion by allowing dispersion in each subwindow to be controlled separately** while providing modular multiplexing and amplification of optical signals in a set of multiple channels in an operating window) are not recited in the rejected claim(s). Although the claims are

interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Otsuka clearly discloses a plurality of subwindows (col. 9, lines 5-15 and odd, even, figs. 3, 6) within the operating window and a first multiplexing unit (3-1, figs. 3, 6) for multiplexing the optical signals in the set of multiple channels (1-1, 1-3, figs. 3 and 1-1, 1-(4i-3), fig. 6) into at least one subgroups of optical signals (col. 9, lines 5-15 and 1-1, 1-(4i-3), fig. 6) associated with one of the plurality of subwindows (col. 9, lines 10, 13 and odd, figs. 3, 6) within the operating windows, such that each subwindow (odd, figs. 3, 6) corresponds to and is associated with a different group of channels (1-1, 1-3, figs. 3, 6) within the operating window; and an optical line amplifier (18W, fig. 15) for amplifying the subgroup of optical signals (ch. 1, ch. 2i-1, fig. 15) associated with the one subwindow (odd, fig. 15) within the operating window. Otsuka further clearly disclosed a first (16, fig. 7) and a second (13-1, fig. 7) wavelength division multiplexing unit, and an optical fiber link (col. 1, line 40) for coupling the first and the second multiplexers. As to dispersion compensating means, the secondary reference of Little clearly show such means. As well recognized in the optical system, when signals travel through optical fibers dispersion will occur. Therefore, it is extremely obvious to incorporate such compensation means in the system of Otsuka.

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Taylor (US Patent No: 5,938,309) is cited to show a wavelength division multiplex communication system that comprised of optical transmitters for providing optical signals of different wavelengths within an operating window, fine multiplexing, coarse multiplexing, optical links, optical amplifiers and demultiplexing.

Takada (US Patent No: 5,949,563) is cited to show multiplexing (11M, 12M, fig. 2) of optical signals into first and third subgroups, and demultiplexing (11D, 12D, fig. 2) of optical signals into a second and fourth subgroups of optical signals within an operating window.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mohammad Sedighian whose telephone number is (703) 308-9063. The examiner can normally be reached on 8:00 AM to 4:00 PM from Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached on (703) 305-4729. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3988.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Jason Chan
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